

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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MOBILEYE GLOBAL, INC.,  
Petitioner

v.

FACET TECHNOLOGY CORP.,  
Patent Owner

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IPR2024-01110  
U.S. Patent No. 9,335,255 B2

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**PATENT OWNER'S PRELIMINARY RESPONSE**

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**Patent Owner's Exhibit List**

| <b>Exhibit No.</b> | <b>Description</b>                                                                                                                                                                                                                                            |
|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2001               | Exclusive Patent License Agreement between Facet Technology Corp. and Mandli Communications, Inc. (and patent assignment coversheet), recorded at Reel No. 062371, Frame 0313                                                                                 |
| 2002               | Statutory Disclaimer of certain claims filed in file wrapper of U.S. Patent No. 9,335,255                                                                                                                                                                     |
| 2003               | U.S. Provisional Patent Appl. No. 60/296,596                                                                                                                                                                                                                  |
| 2004               | Docket Control Order filed in <i>Facet Tech. Corp. v. Mobileye Glob., Inc.</i> , No. 2:24-cv-00058 (E.D. Tex.)                                                                                                                                                |
| 2005               | Excerpts from U.S. District Court — Judicial Caseload Profile (2024 Ed.), <i>available at</i> <a href="https://www.uscourts.gov/file/78884/download">https://www.uscourts.gov/file/78884/download</a>                                                         |
| 2006               | Complaint Filed in <i>Facet Tech. Corp. v. Mobileye Glob., Inc.</i> , No. 2:24-cv-00058 (E.D. Tex.)                                                                                                                                                           |
| 2007               | Cover Pleading to Plaintiff's Disclosure Of Asserted Claims And Infringement Contentions, as served on August 26, 2024 in <i>Facet Tech. Corp. v. Mobileye Glob., Inc.</i> , No. 2:24-cv-00058 (E.D. Tex.)                                                    |
| 2008               | Cover Pleading to Defendant's Invalidity Contentions, as served on November 4, 2024 in <i>Facet Tech. Corp. v. Mobileye Glob., Inc.</i> , No. 2:24-cv-00058 (E.D. Tex.)                                                                                       |
| 2009               | National Institute of Standards and Technology, "Redefinition of 'Candela,'" <i>available at</i> <a href="https://www.nist.gov/si-redefinition/candela">https://www.nist.gov/si-redefinition/candela</a>                                                      |
| 2010               | International Commission on Illumination, Standard. No. CIE S 017:2020 ILV: International Lighting Vocabulary, 2nd edition., entry no. 17-21-050, <i>available at</i> <a href="https://cie.co.at/eilvterm/17-21-050">https://cie.co.at/eilvterm/17-21-050</a> |
| 2011               | Excerpts from Stefanov, Konstantin D. CMOS Image Sensors. Bristol, UK: IOP Publishing, 2022.                                                                                                                                                                  |

| Exhibit No. | Description                                                                                                                                                                                                                                                                                                                                                                                                                                |
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| 2013        | Steely, Sidney L., H. S. Lowery III, and R. H. Fugerer. "Laser-based direct-write scene generation methods for closed-loop focal-plane-array diagnostics." Technologies for Synthetic Environments: Hardware-in-the-Loop Testing. Vol. 2741. SPIE, 1996.                                                                                                                                                                                   |
| 2014        | Collins Dictionary Entry for “profile,” <i>available at</i> <a href="https://www.collinsdictionary.com/us/dictionary/english/profile">https://www.collinsdictionary.com/us/dictionary/english/profile</a>                                                                                                                                                                                                                                  |

Pursuant to 35 U.S.C. § 313 and 37 C.F.R. § 42.107, Patent Owner Facet Technology Corp. (“Patent Owner” or “Facet”)<sup>1</sup> hereby submits its Patent Owner’s Preliminary Response.

## **I. INTRODUCTION**

Petitioner challenges claims 12-15 and 17-23 of U.S. Patent No. 9,335,255 (“the ’255 Patent”). Ex. 1001. Pursuant to 35 U.S.C. § 253 and 37 C.F.R. § 1.321(a), a statutory disclaimer of claims 12-14 and 17-23 has been filed in the file wrapper of the ’255 Patent. Ex. 2002. Accordingly, disclaimed claims 12-14 and 17-23 are moot and are not a basis for institution of *inter partes* review. 37 C.F.R. § 42.107(e) (“No *inter partes* review will be instituted based on disclaimed claims.”).

Thus, the sole remaining challenged claim is claim 15. Claim 15 depends from claim 12 and further recites “determining a luminance value utilizing the plurality of light intensity values and a characterization profile of the at least one

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<sup>1</sup> As set forth in Patent Owner’s mandatory disclosures (Paper No. 6), Facet Technology Corp. (hereinafter “Patent Owner”), the party submitting this paper, is the exclusive licensee to the ’255 Patent, expressly having “all substantial rights” in that patent. Ex. 2001 § 1.1, Schedule 1 § 1.1. To the extent that the Board requires additional documentation to confirm Facet Technology Corp.’s authority to file this preliminary response and participate in this *inter partes* review proceeding, it is prepared to do so.

light intensity sensor.” Petitioner challenges claim 15 over the combination of Gallagher and Lumia, and Petitioner relies on the disclosures of the Lumia reference for the limitation added in claim 15. However, Lumia does not actually determine a luminance value, and does not use a sensor’s characterization profile. Rather, Lumia performs a calibration procedure on a single sign that assumes a constant and unchanging distance to the sign, entrance angle, and observation angle. As a result, Lumia directly associates light intensity values with retroreflectivity values, bypassing any actual “determin[ation] of a luminance value” or the use of a sensor’s characterization profile. Indeed, Lumia is the predecessor system to the “SMARTS” system specifically distinguished in the specification of the ’255 patent. Ex. 1001 (’255 Patent) at 2:52-3:19.

Moreover, Petitioner fails to articulate a plausible obviousness theory for how Lumia could be combined with Gallagher. In particular, Federal Circuit case law requires a clear, evidence-supported account of the contemplated workings of the proposed combination. The Petition fails to meet this standard—it wholly fails to describe *how* Petitioner proposes the disparate components and aspects of Lumia’s and Gallagher’s systems (or their teachings) would be combined to meet each of the limitations of claim 15 (and claim 12 from which it depends). In particular, Lumia’s image-based system requires that an operator manually aim and “lock on” a camera so that it is centered on the sign to be measured. This is necessary to the operation

of the Lumia system so that Lumia's computer can capture and isolate the image of the sign and create a histogram that Lumia uses to calculate retroreflectivity values. By contrast, Gallagher continuously records light intensity information from an array of photodiode light sensors. Gallagher automatically determines the presence and reflectivity of road markers merely by identifying peak responses within that continuously recorded photodiode data. However, neither Petitioner nor its expert articulate how a POISTA would combine the disclosures of the references, with their vastly different sensor types and modes of operation, into a functional system practicing claim 15.

Moreover, as discussed below, because the *Fintiv* factors weigh in favor of denial, the Board should exercise its discretion to deny institution under section 314(a).

For all of these reasons, institution should be denied.

## **II. OVERVIEW OF THE '255 PATENT**

The '255 Patent relates to systems and methods for recognizing road markers (e.g. road signs, pavement markings, etc.) depicted in a videostream. Ex. 1001 ('255 Patent), Abstract. Most road markers are designed to be retroreflective, i.e. to reflect nearly all light back towards the source light or slightly off-angle from the source light, with minimal scattering. *Id.* at 1:61-2:4. As a result, a great deal of light from the headlights of a vehicle on the road can be reflected from a retroreflective road

marker to the driver's eyes, allowing for the driver to readily observe the road markers, particularly at night. *See* Ex. 2003 ('596 Prov. App.) at 66-67. However, it is important to ensure that the reflective performance of such road markers are not degraded, so that they can continue to be seen by drivers. Thus, identifying road markers and measuring their retroreflectivity is helpful in evaluating the visibility of a sign and whether it has deteriorated due to a breakdown in the pigments or reflective material. Ex. 1001 at 2:5-12. However, prior to the '255 patent, such systematic evaluation of road markers by highway and street maintenance departments has been difficult, often requiring holding a handheld retro reflectometer directly in front of a sign. *Id.*

Thus, the inventors of the '255 Patent identified a critical problem in identifying and creating an accurate inventory of road and traffic signs along a given street or highway. The '255 Patent provides several advantages over the prior art, allowing measurement of the retroreflectivity of a traffic sign without the need to target individual signs and automatically determining sheeting classification. *Id.* at 4:11-23. The '255 Patent describes using an automated system to detect and determine the reflective surfaces along a roadway, capturing images along the roadway, using a light sensor to illuminate the roadway and measure light intensity, and using a computer processing system connected to the image capture system and light sensor that can detect objects of interest within the field of view of the light

source. *Id.* at 3:60-4:10. The patent further describes that the computer processing system can determine an object's location, whether the object includes a reflective surface, the retroreflectivity of the surface, and whether the reflective surface is a road marker. *See id.* at 4:12-17, 8:53-9:13, 12:1-36, cl. 12.

### **III. LEVEL OF ORDINARY SKILL IN THE ART**

Petitioner asserts that a person of ordinary skill in the art ("POSITA") would have had at least a bachelor's degree in mechanical engineering, electrical engineering, computer science, physics, or related discipline, and four years of experience in research, design, or development in computer vision systems. Pet. at 7. For the purposes of this preliminary response, Patent Owner does not presently dispute that characterization, as Patent Owner believes that institution should be denied regardless of the specific level of skill in the art. However, Patent Owner reserves the right to assert a different level of ordinary skill in the art if this IPR is instituted.

### **IV. CLAIM CONSTRUCTION**

Petitioner has only identified for construction the "means" term in claim 17. Pet. at 8; Ex. 1001 ('255 Patent), cl. 17. However, as discussed, a statutory disclaimer has been filed for claim 17 and each of its challenged dependent claims. Ex. 2002. Thus, the claim construction issue raised by Petitioner is moot.

For the purposes of the Board's decision on institution, Patent Owner does not contend that any claim term should receive an express construction. In the event that this Petition is instituted, Patent Owner reserves the right to raise different or additional claim construction issues in its Patent Owner Response.

**V. PETITIONER HAS FAILED TO DEMONSTRATE A REASONABLE LIKELIHOOD THAT THE REMAINING CHALLENGED CLAIMS ARE UNPATENTABLE<sup>2</sup>**

**A. Ground 1: Gallagher Fails to Anticipate Any Remaining Challenged Claims**

Ground 1 challenges claims 12-14, 17, 21, and 23. Pet. At 2. A statutory disclaimer has been submitted for each of those claims. Ex. 2002. Thus, Petitioner's ground for those claims is moot. 37 C.F.R. § 42.107(e).

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<sup>2</sup> In this preliminary response, Patent Owner only presents arguments against institution of this Petition. In the event that this Petition is instituted, Patent Owner reserves the right to raise additional or different arguments in its Patent Owner Response.

**B. Ground 2: The Combination of Gallagher and Lumia Fails to Render Obvious Any Remaining Challenged Claims**

**1. Claim 15**

**(a) The cited references fail to disclose or suggest “determining a luminance value utilizing the plurality of light intensity values and a characterization profile of the at least one light intensity sensor”**

**(1) Light intensity, luminance, and retroreflectivity are distinct**

Claim 15 recites “determining a luminance value utilizing the plurality of light intensity values and a characterization profile of the at least one light intensity sensor.” As the language of claim 15 itself confirms, luminance is distinct from light intensity. Light intensity, or luminous intensity, is essentially the power emitted by a light in a particular direction. Ex. 2009, 3-4. Luminous intensity is measured in candelas, which is a unit that attempts to match the modern understanding of the human eye with what people perceive to be a light source’s brightness. *Id.* at 4-5. In particular, one candela is the amount of light “in a given direction, of a source that emits monochromatic radiation of frequency  $540 \times 10^{12}$  hertz and that has a radiant intensity in that direction of 1/683 watt per steradian.” *Id.* at 5.

By contrast, luminance is the luminous intensity projected on a given area and direction, i.e. the amount of visible light leaving a point on a surface in a given direction. Ex. 2009 at 2; Ex. 2010 at 1 (defining luminance as “density of luminous intensity with respect to projected area in a specified direction at a specified point

on a real or imaginary surface.”). Moreover, luminance is typically measured in candelas per square meter. Ex. 1001 (’255 Patent) at 10:65-67. Luminance is also distinct from retroreflectivity, as indicated by the different use of those terms in different claims. *Compare* Ex. 1001, cl. 15 (“determining a luminance value”) *with* cl. 1 (“generate an as-measured retroreflectivity profile”). In particular, while luminance of a road marker is strictly a measure of reflected light, a road marker’s retroreflectivity is a measure of the reflected light with respect to incident light of that object. Ex. 1001 at 11:61-64. Retroreflectivity is typically measured (at least for road signs) in candelas per lux per square meter. *Id.*

Thus, claim 15 requires a method that determines a *luminance* value, which is distinct from mere light intensity values or the measurement of retroreflectivity.

**(2) Lumia’s System Does Not Actually Determine Luminance**

Contrary to the requirements of claim 15, none of the portions of Lumia cited by Petitioner actually disclose determining a luminance value utilizing a plurality of light intensity values and a characterization profile of a light intensity sensor. Notably, Lumia does not state that it *determines* luminance, rather Lumia discloses that the use of a video camera “effectively” “create[s] individual luminance meters.” Ex. 1014 at 7. Rather than *actually* determining luminance, Lumia creates a histogram of *light intensity* reflected by grey levels of pixels in a captured image of

the road sign, where the grey levels range from 0 to 255 (i.e. an 8-bit grey value). *Id.* at 8; *see also id.* at 7 (“The histogram of the extracted sign area is shown in Figure 3(b), plotted as relative number of image points versus reflected light **intensity** (camera gray levels)”) (emphasis added), *id.* at 6 (“histograms of the retroreflected **intensity** distribution”) (emphasis added). Thus, even after identifying the relevant peaks within the histogram, the *values* remain grey level light *intensity* values. Indeed, Lumia notes that—under the particular assumptions that Lumia’s calibration system requires—such 8-bit grey levels merely “correspond[] to the average luminance,” but Lumia does not disclose that any luminance values are actually determined. *Id.* at 7.

Moreover, although Lumia mentions a mathematical formula where one *could* calculate retroreflectivity using distance and luminance measurements (Ex. 1014 at 7), that is not what Lumia’s actual system does. Rather, to create functional system with the technology of the time, Lumia’s system uses a number of shortcuts. In particular, Lumia’s system is designed to trigger only at a fixed 200 foot distance from the sign. Ex. 1014 at 6, 11. 15. This permits Lumia’s system to assume a constant 0.2 degree observation angle. *Id.* at 12, 15. Moreover, Lumia elects not to measure, calculate, or compensate for the entrance angle, noting that “entrance angle of most signs at appreciable distances is small.” *Id.* at 21. As a result of all of these shortcuts, Lumia is able to compute a “scale factor to convert the 8-bit digital gray

levels of the calibration target to R' [retroreflectivity] values.” *Id.* at 15.<sup>3</sup> That is, rather than “determining a luminance value” as recited in claim 15, and thereafter using the luminance value to calculate retroreflectivity, Lumia instead simply converts the peak histogram values of the greyscale camera’s digital light **intensity** measurements directly into a R' value (the coefficient of retroreflection). *Id.*

Accordingly, Petitioner fails to demonstrate that the cited prior art discloses or suggests determining a luminance value, as recited by claim 15.

**(3) Lumia’s System Does Not Utilize a Characterization Profile In the Manner Claimed**

Moreover, Petitioner asserts that Lumia’s “calibration” procedure satisfies claim 15’s requirement to “utilize ... a characterization profile of at least one light intensity sensor” to determine the luminance value. Pet. at 45-46; Ex. 1003 ¶¶ 114, 115. However, Petitioner’s argument is only supported by conclusory expert testimony. Pet. at 45 (citing Ex. 1003 ¶ 115 (“a POSITA would have understood Lumia’s calibration to disclose a characterization profile that relates the light intensity values of the video camera (light intensity sensor) to corresponding luminance values.”)). Such conclusory testimony—which fails to even explain what

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<sup>3</sup> Lumia uses R' to refer to the “Coefficient of Retroreflection.” Ex. 1014 at 7.

a characterization profile is—is entitled to no weight. *See Xerox Corp. v. Bytemark, Inc.*, IPR2022-00624, Paper 9 at 5-6 (P.T.A.B. Aug. 24, 2022) (precedential).

Contrary to Petitioner’s argument, the ’255 Patent describes the sensor’s characterization profile as “empirical information about the light intensity sensor 280 that is used to create [for example] the LUT [look up table] 475.” Ex. 1001 at 11:56-60. It explains that “[l]ight intensity sensor 280 characterization is essential for high precision computations since N photons of a given particular color (or wavelength) of light will represent a different gray value (intensity level) in the sensor than N photons of another color (or wavelength) of light.” *Id.* at 11:48-53. Thus, “look-up-table (LUT) 475 ... uses the indexes of intensity (a single gray level value from the intensity measurement 300) and sheeting color to determine the luminance.” *Id.* at 11:53-56 (emphasis added). Notably, in the ’255 Patent, only *after* luminance values are actually calculated by LUT 475 using the sensor characterization 275, intensity values 470 / 480, and the sheeting color 505 / 506, are the luminance then values input into the separate retroreflection calculation. Ex. 1001 (’255 Patent), Fig. 7 (depicting luminance inputs into “compute R<sub>A</sub>”), 11:56-60. And, that retroreflection calculation also uses other inputs, including the light source angle information, light source color information, sensor location, sign location, and sheeting color information. *Id.*

The usage of “characterization profile” in the ’255 Patent is also consistent with its ordinary meaning in the field. In particular, “sensor characterization” is the process of describing the properties and performance characteristics of a sensor across *various* conditions. Ex. 2011 at 10-11 (§5.1) (sensor characterization “aims to experimentally measure the parameters of the sensor under different operating conditions”); Ex. 2012 at 2-3 (“Sensor characterization is necessary to ensure a guaranteed level of readout accuracy over various operating conditions ... Manufacturers need to characterize the sensors they produce to analyze their dynamic range, linearity bandwidth, response time, noise and stability ... [to] allow[] users to know how to use sensors in their applications effectively.”); Ex. 2013 at 1-2 (describing developing “electro-optical sensor characterization and evaluation” as involving “[t]esting and evaluation (T&E) and modeling and simulation (M&S) of electro-optical sensor systems to assess their operational characteristics [and] their performance limits” and noting that “a sensor will generally have a particular set of important design and test parameters that characterize its operation, function, and performance”). A characterization profile is thus the compilation of that description into a set of characteristics presented in a usable format. Ex. 2014 at 3 (defining “profile” as, among other things, “5. a. a graph, diagram, piece of writing, etc. presenting or summarizing data relevant to a particular person or thing”).

Lumia’s calibration procedures fail to satisfy the “characterization profile” limitation. Rather than attempting to describe properties or performance characteristics of a sensor that are needed to convert light intensity to luminance, Lumia’s calibration process simply computes a single number—the “scale factor”—which converts “8-bit digital gray levels” to “R’ [retroreflectivity] values.” Ex. 1014, at 15. Moreover, rather than evaluating the sensor under *various* conditions, Lumia’s calibration (and the scale factor) is limited to a single calibration, in the single situation of “an observation angle of 0.2° and at a distance of 200 feet” looking at only a single sign (“an image of a calibrated white sheeting material”). *Id.*; *see also id.* at 12 (discussing distance window), at 7 (“200 feet”).

Accordingly, Petitioner fails to demonstrate that the cited prior art discloses or suggests utilizing a sensor’s characterization profile to determine luminance values, as recited by claim 15.

**(b) Petitioner fails to articulate *how* a POSITA would or could predictably combine the disparate systems of Gallagher and Lumia in the manner claimed**

A “clear, evidence-supported account of the contemplated workings of the combination is a prerequisite to adequately explaining and supporting a conclusion that a relevant skilled artisan would have been motivated to make the combination and reasonably expect success in doing so.” *Personal Web Technologies, LLC v. Apple, Inc.*, 848 F. 3d 987, 994 (Fed. Cir. 2017) (vacating obviousness holding where

“the Board nowhere clearly explained, or cited evidence showing, how the combination of the two references was supposed to work.”); *see also Kinetic Concepts, Inc. v. Smith & Nephew, Inc.*, 688 F. 3d 1342, 1368 (Fed. Cir. 2012) (obviousness showing requires an “explanation as to how” the cited prior art “would be combined to produce the claimed invention.”).

Petitioner’s obviousness theory for claim 15 plainly fails the basic requirements to explain *how* the combination of the Gallagher and Lumia (or their teachings) is supposed to work. Indeed, neither the Petition nor Petitioner’s expert declaration contains any dedicated section describing the proposed Gallagher-Lumia combination it asserts to render claim 15 obvious. Instead, Petitioner and its expert merely subsume the entirety of the obviousness analysis in their arguments that Lumia discloses claim 15. Pet. at 44-47; Ex. 1003 ¶¶113-117. And, the only description in the Petition of the nature of the proposed Gallagher-Lumia combination is the conclusory assertion that “[a] POSITA would have found it obvious to implement Lumia’s determining a luminance value utilizing the plurality of light intensity values and a characterization profile of the at least one light intensity sensor to allow Gallagher’s apparatus to calculate the retro reflectivity of road markers.” Pet. at 46. Petitioner’s expert’s declaration contains the same conclusory assertion. Ex. 1003 ¶ 116. But merely repeating the claim language, and

identifying the references combined falls far short of an “evidence-supported account of the contemplated workings of the combination.”

Petitioner’s predictability analysis is similarly inadequate in setting forth how the proposed Gallagher-Lumia combination works. It merely notes that the references both measure reflective characteristics of retroreflective surfaces from a moving vehicle using a light intensity sensor, mentions that both involve some sort of calibration, and then conclusorily asserts that “Lumia’s determining a luminance value could be readily implemented in Gallagher’s apparatus.” Pet. at 46-47. Petitioner’s expert’s declaration contain the same conclusory statements and citations, nearly verbatim. Ex. 1003 ¶ 117.

Moreover, Petitioner ignores the significant differences in the function, structure, and operation of Lumia and Gallagher. In particular, Gallagher uses five to ten *photodiodes* to form a sensor array. Ex. 1005, [0038]-[0039]. This sensor array *continuously* collects light intensity information while the vehicle drives on “a stretch of road” having multiple road markings. *Id.* at [0012], [0030], [0056], [0064], [073], Fig. 5<sup>4</sup> Gallagher determines that a road marker is present solely by identifying peak responses in that continuously collected light intensity information.

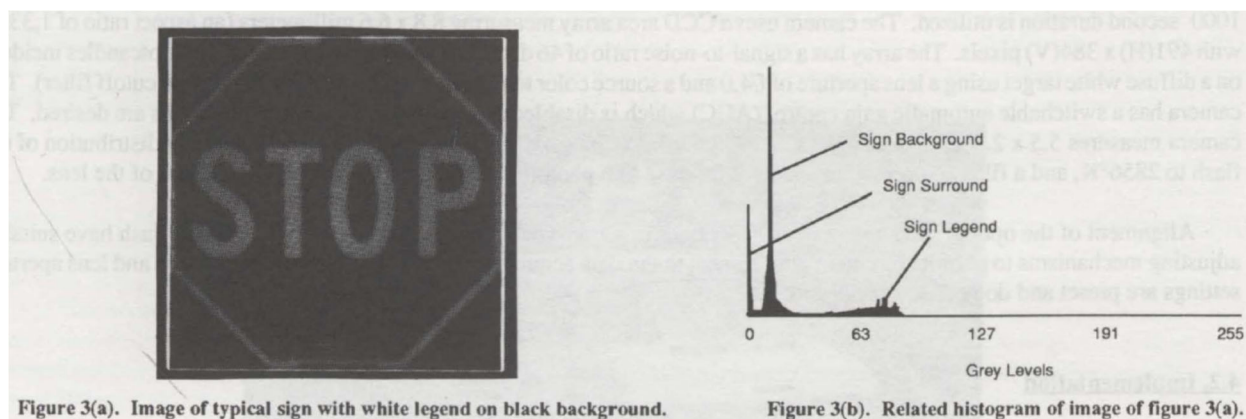
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<sup>4</sup> Although Gallagher purports to be able to test the reflectivity, it only describes the invention in the context of pavement markers. Ex. 1005, [0033].

*Id.*, [0066], Fig. 5; *see also* Pet. at 14 (characterizing Gallagher as “identifying road markers based on ‘peak responses sensed’ by light sensors”). Then, Gallagher compares the responses to a predetermined minimum acceptable reflectance level to determine if a road marker is missing. *Id.* at [0067]-[0068]. Optionally, Gallagher can calibrate the data by multiplying the sensor data by a predetermined calibration factor to calibrate for the different sensor positions. *Id.* at [0058]-[0059]. Generally, the only aiming required for the Gallagher device is that the vehicle driver is given an indicator signal to continue to “maintain the vehicle 3 in a proper position on the road,” i.e. to “have the most central of the light sensors 6 detecting the highest reflectance levels.” *Id.* at [0060]-[0061]. Thus, Gallagher comprises a system where the sole light sensors are simple photodiodes, and reflectivity of road markers is determined solely by examining peak light intensity responses among the continuously collected photodiode data.

In contrast to Gallagher, Lumia is a system for calculating reflectivity of traffic signs where the sole light sensor is a *camera* which outputs a gray-scale *image* for each sign. Ex. 1014, 17. The Lumia system requires a second operator, in addition to the driver, to “manually aim[]” the camera to be centered on each sign to be measured. *Id.* at 8. Lumia’s system also uses a rangefinder, but that rangefinder is merely used—after the operator has locked on to the sign—to trigger the xenon flash and a frame grabber software to record a still image from the video camera

when the vehicle reaches the pre-determined 200 foot distance from the sign. *Id.* at 6, 11. After the image is recorded, “[s]oftware is used to extract the sign area from the image.” *Id.* at 7. Then, a histogram is created of the 8-bit (0 to 255) gray levels present in the cropped black-and-white camera image:



Ex. 1014, 8 (depicting gray level scale of 0 to 255), 15 (“8-bit digital gray levels.”).

Lumia then isolates peaks within the image’s histogram and calculates the relative area corresponding to each peak, which allow sit to identify the grey levels corresponding to the sign background, sign surround, and sign legend. Ex. 1014 at 7-8. Then, the grey level values for the sign background and legend are converted to retroreflectance values using a “scale factor.” *Id.* at 15.<sup>5</sup>

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<sup>5</sup> As discussed, the scale factor is a single number which is the result of a prior calibration procedure which uses a fixed 200 foot distance, constant 0.2 degree observation angle, zero entrance angle, and calibrated white sheeting material. Ex. 1014 at 15; *see also id.* at 12.

In short, Gallagher is a system where photodiodes *continuously* record intensity values in order to identify peak responses as indicating the presence of pavement markers. By contrast, Lumia is a system where an operator *separately* locks onto an *individual* sign with a video camera, takes a gray scale *image* of the sign, and uses a histogram of the frequency of grey level values among the pixels of the image to measure the sign's retroreflectivity. Given the significant differences in the function, structure, and operation of Gallagher and Lumia, Petitioner's obviousness allegations leave more questions than answers in answering the question of "how" Petitioner proposes the references to be combined. For example—which intensity sensors does the proposed combination have and use: Gallagher's photodiodes, Lumia's camera, or both? Notably, although claim 15 depends from claim 12, Petitioner's obviousness analysis contains no identification of which reference is asserted to supply which limitations of claim 12, including the "at least one intensity sensor" limitation. *Compare* Pet. at 47 ("Gallagher and Lumia render obvious the additional limitations of claim 15.") *with* Pet. at 40 ("As discussed for Ground 1, claim 13, Gallagher discloses or suggests the additional limitations of claim 13.).

Presumably, Petitioner must be asserting that, in Ground 2 as to claim 15, all of the limitations of claim 12 are met by Gallagher's disclosures, as nowhere in the Petition is there any comparison of the limitations of claim 12 to Lumia. However,

if Petitioner contends that, in Ground 2, the limitations of claim 12 are being met solely by Gallagher and its photodiodes, that means that the photodiodes are the “at least one intensity sensor” that is “determining a plurality of light intensity values,” as recited in limitation 12B of claim 12. Ex. 1001 (’255 Patent), cl. 1; Pet. at 31-33. But, because that phrase provides the antecedent basis for “the plurality of light intensity values” in claim 15, that would require Lumia to use the outputs of Gallagher’s photo diodes (as Petitioner solely identifies Lumia as satisfying the limitations of claim 15). But neither Petitioner nor its expert provide any explanation for how Lumia’s image-analysis and histogram-based approach would be workable using the continuously recorded data output from Gallagher’s photodiodes. To the extent that Petitioner is contending that the combination would only use a camera, and not Gallagher’s photodiodes, Petitioner provide no explanation for how a combination using Lumia’s camera-based approach would satisfy the limitations of claim 12 (particularly limitations 12B-12E), given that Petitioner has only provided a limitation-by-limitation analysis for Gallagher and its photodiode system against claim 12. To the extent that Petitioner is contending that a combination of Gallagher and Lumia would use both photodiodes and a camera, Petitioner presents no explanation how such a system would work, or how the same “plurality of light intensity values” satisfies claim 12 and claim 15 when there are two different sensors collecting two different sets of data. Nor does Petitioner explain whether the

combination would use Gallagher's continuous data method for identifying road markers, or Lumia's manual aiming approach (and Petitioner does not explain how Lumia's manual aiming approach is an "automated method" as recited in limitation 12P).

In short, Petitioner's explanations regarding *how* it proposes Gallagher and Lumia would be combined to practice claim 15 fall far short of clear, evidence-supported account of the contemplated workings of the combination required under Federal Circuit case law. *Personal Web Techs.*, 848 F. 3d at 994. Indeed, given the vagaries of Petitioner's obviousness theory for claim 15, Patent Owner has been deprived of a fair opportunity to respond to the Petition with detailed, fact-specific non-obviousness theories regarding the proposed combination. This is exactly why the IPR statutes provide that a petition "may be considered only if .... (3) the petition identifies, in writing and with particularity, ... the grounds on which the challenge to each claim is based." 35 U.S.C. § 312(a)(3). Because the Petition fails to adequately state how Petitioner proposes Gallagher and Lumia would be combined so as to practice claim 15, the petition should be denied.

## **2. Claim 13**

Other than claim 15, the only other claim challenged in ground 2 is claim 13. Pet. at 2. However, a statutory disclaimer has been submitted for claim 13. Ex. 2002. Thus, Petitioner's ground for that claim is moot. 37 C.F.R. § 42.107(e).

**C. Ground 3: The Combination of Gallagher and Schofield, Fails to Render Obvious Any Remaining Challenged Claims**

Ground 3 challenges claims 18-19. Pet. at 2. A statutory disclaimer has been submitted for each of those claims. Ex. 2002. Thus, Petitioner's ground for those claims is moot. 37 C.F.R. § 42.107(e).

**D. Ground 4: The Combination of Gallagher and Frank Fails to Render Obvious Any Remaining Challenged Claims**

Ground 4 challenges claim 20. Pet. at 2. A statutory disclaimer has been submitted for that claim. Ex. 2002. Thus, Petitioner's ground for that claim is moot. 37 C.F.R. § 42.107(e).

**E. Ground 5: The Combination of Gallagher and Curie Fails to Render Obvious Any Remaining Challenged Claims**

Ground 5 challenges claim 22. Pet. at 2. A statutory disclaimer has been submitted for that claim. Ex. 2002. Thus, Petitioner's ground for that claim is moot. 37 C.F.R. § 42.107(e).

**VI. THE BOARD SHOULD EXERCISE ITS SECTION 314(a) DISCRETION TO DENY INSTITUTION**

Subsequent to the filing of the Petition, a docket control order was entered in *Facet Tech. Corp. v. Mobileye Glob., Inc.*, No. 2:24-cv-00058 (E.D. Tex.), which is the litigation asserting the '255 Patent against Petitioner. *Id.*, Dkt. 25 (Ex. 2004 hereto); Pet. at 57. That order sets a trial date of February 17, 2026. Ex. 2004 at 1. By contrast, if instituted, a final written decision in this *inter partes* review would

likely be issued by March 10, 2026. 35 U.S.C. § 314(b) (decision on institution expected by approximately March 10, 2025, three months from this preliminary response); 35 U.S.C. § 316(a)(11) (final written decision expected by approximately March 10, 2026, one year from decision on institution). Moreover, the February 17, 2026 trial date is quite realistic. The February 17, 2026 trial date is approximately 24-25 months from the January 26, 2024 filing date of the litigation. Indeed this is less aggressive than the typical case in the Eastern District of Texas, whose most recent median time from filing to trial in civil cases is 21.3 months. Ex. 2005, *available at* <https://www.uscourts.gov/file/78884/download>.

Here, each of the *Fintiv* factors weigh in favor of discretionary denial. *See Apple Inc. v. Fintiv, Inc.*, IPR2020-00019, Paper No. 11 (P.T.A.B. March 20, 2020) (precedential). As to *Fintiv* factor 1, there is no stay of Patent Owner's Eastern District of Texas ("EDTX") action against Petitioner. Nor is there any reason to believe that a stay will be granted.

*Fintiv* factors 2 and 3 also weigh in favor of discretionary denial. The '255 Patent is asserted in Patent Owner's EDTX action against Petitioner. Ex. 2006 (complaint) at 1, 4; Pet. at 57. As discussed, the trial in that case is scheduled for trial on February 17, 2026, nearly a month before the expected Final Written Decision date if this IPR is instituted. And, the litigation has already significantly progressed. In particular, discovery has already begun and the parties have already

exchanged infringement and invalidity contentions. Ex. 2004 (Docket Control Order) at 4-5; Ex. 2007 (infringement contentions); Ex. 2008 (invalidity contentions).

*Fintiv* factor 4 also weighs in favor of discretionary denial. Overlap between this IPR and the litigation is significant. Plaintiff identified the asserted claims as claims 12-15 and 17 of the '255 Patent. Ex. 2007 at 1. Thus, the remaining challenged claim—claim 15—will be addressed in the EDTX litigation. Moreover, Petitioner's invalidity contentions served in the EDTX case include the same combination of references as the remaining, non-moot grounds of its Petition (i.e. ground 2 as to claim 15). *See* Ex. 2008 at 25 (identifying claim chart "A-4" as combination including Gallagher and Lumia). Nor has petitioner offered any stipulation to remove or reduce such overlap. Pet. at 56.

*Fintiv* factor 5 weighs in favor of discretionary denial. The parties in this IPR are the same as in the pending litigation in EDTX. Ex. 2006 at 1 (complaint).

Finally, *Fintiv* factor 6 weighs in favor of discretionary denial. As discussed above, the merits of the petition are extraordinarily weak as to the remaining challenged claim (claim 15). Indeed, as discussed, Petitioner fails to show that the cited references disclose any actual "determin[ation] of a luminance value" or the use of a sensor's characterization profile. *Supra* V.B.1.a. And, as discussed,

Petitioner fails to articulate any concrete obviousness theory for *how* Lumia would be combined with Gallagher to result in a system of claim 15. *Supra* V.B.1.b.

Because all *Fintiv* factors weigh in favor of denial, the petition should be discretionarily denied pursuant to the Board's discretion under 35 U.S.C. § 314(a).

## VII. CONCLUSION

For the above reasons, Patent Owner requests that institution of this Petition for *inter partes* review be denied.

Dated: December 10, 2024

Respectfully submitted,

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**Certificate of Service 37 C.F.R. § 42.6(e)**

The undersigned certifies that on December 10, 2024, I will cause true and correct copies of the foregoing Patent Owner's Preliminary Response, and all associated exhibits or appendices referred to therein, to be served electronically upon the following attorneys who have consented to service via email. Pet. at 58.

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**Certificate of Compliance Pursuant to 37 C.F.R. § 42.24**

This paper complies with the type-volume limitation of 37 C.F.R. § 42.24.

This paper contains 5,299 words, excluding the parts of the paper exempted by 37 C.F.R. § 42.24(a).

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